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NOISE ELEMENT

MENDOCINO COUNTY

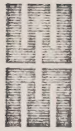
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14 March 1975

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[Williams + Mocine]

County planning Mendocino Co.
City planning Noise abatement

Gentlemen:

This report has been prepared pursuant to our contract with the County to investigate existing noise levels and potential environmental problems in relation to noise; further, to prepare a Noise Element to be adopted as part of the Mendocino County Plan as required by State law. This report contains the pertinent background and research material as well as the Noise Element to be adopted. The Element for adoption is found on pages 28 to 40.

Mendocino County does not now have severe noise problems and it has the opportunity to avoid future problems through good land use planning which recognizes noise as one factor to be considered in making development decisions. The Noise Element provides the necessary policy guide to assure that the superior environmental qualities of the County are not degraded through intrusion of unnecessary, unwanted noise. The background sections will provide additional guidance in making the day to day decisions concerning land use and development.

While land use planning is the most important implementation measure in the relatively sparsely developed County, adoption of a Noise Ordinance may be advisable in the future. The research included in this report will assist citizens and officials to understand the nature and scale of the problems and to make decisions concerning the need for an ordinance and for including performance standards for certain uses as provisions in the zoning ordinance.

The Consultants were very ably assisted by the Mendocino County Health Department in preparing this report. We thank Dr. Robert L. Holtzer, the Director of the Department for assigning David Long, Director of Environmental Health and Gerald F. Davis, Supervising Sanitarian, to this task. We have enjoyed working with them.

Sincerely yours,

Margaret W. Rusche

M.W. Rusche, AIP
Principal Planner
MWR:ji

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INTRODUCTION

NOISE AND ITS EFFECTS

Noise is defined as sound that is annoying or which has a detrimental effect on human physiologic or psychologic processes. Some sounds have more adverse effects than others; the most annoying types are the loudest and highest pitched. Intermittent and irregular sound is also very disturbing, and the more random a sound occurrence, the more irritating it becomes. Noise from an uncertain cause, hidden or moving source is more annoying than readily identifiable noise. Unexpected loud sound (the sonic boom) which startles the hearer is extremely disturbing. We seldom object to the constant low-level noise of a residential neighborhood or to the noise we generate ourselves but noise which is inappropriate to our activity becomes obtrusive and annoying. In short--noise is unwanted sound.

Some authorities state that the overall noise level of United States has increased one decibel every year for the past 25 years. In terms of perceived noise, this is about a seven-times increase in 25 years. The increase is astounding but believable considering the increase in population and in the number of new noise-making items which have come into common usage during the period. For example, an electric typewriter produces 60 decibels, a garbage disposal, 80 decibels and a plane 1,000 feet



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overhead, 85 decibels.* None of these was common 25 years ago. Increased noise seems an undesirable by-product of modern living.

The effects of noise have become so serious that there is widespread public interest in controlling and reducing unnecessary sound; as a result, there is a State mandate to include a Noise Element in the General Plan. The United States Environmental Protection Agency states that permanent hearing loss may occur with exposure to sound levels of 70 or more decibels* over a long period of time. Approximately 1 in 10 Americans suffers some measurable hearing loss partly because of such exposure.

Noise also interferes with safety and communication; it causes undue stress and lowers the quality of life generally. Additionally, economic values may be affected by noise. A noisy area is a less desirable place to live, work and play in than a quiet one, and reduced property values or added costs for acoustical insulation may result from noise. It can also lower productivity of workers.

In urban areas, where most Americans live, the transportation facilities are the chief noise generators. It is difficult to adjust urban land use so a major concern is to reduce the noise generated through traffic control, buffering freeways and other means. In Mendocino County, transportation is also a major noise source but, as yet, few people are

* See definitions for dbA scale. Normal conversation at 12 feet from speaker is approximately 50 dbA. For additional information of decibel readings, see the Acoustical Scale.

drastically affected since the County is mainly rural. The County has the opportunity, not only to reduce noise at the source, but to plan in future land uses so that the effects of necessary noise will not be burdensome. A coordinated approach to the problem by citizens, industry and government is needed to reverse the trend towards higher decibels and to have a future environment in which we can hear what we want to hear.

LEGAL AUTHORITY FOR THE NOISE ELEMENT AND RELATIONSHIP TO OTHER ELEMENTS

California Government Code Section 65302 (g) requires a noise element of all City and County General Plans as follows:

A noise element in quantitative, numerical terms, showing contours of present and projected noise levels associated with all existing and proposed major transportation elements.

In addition to the basic law, the Council on Intergovernmental Relationships published General Plan Guidelines* in September, 1973 which expand on the required scope of the noise element and the methodology to be followed. Transportation noise is given major importance as indicated by the law and by the seriousness of this noise source. However, the Guidelines require that other noise sources be investigated as well and standards and criteria in relation to all sources be developed. This is to be done by establishing "noise compatibility levels" for all land use categories.

The Guidelines also state that the Noise Element is related closely to

* Williams and Mocine were co-authors of the Guidelines, under contract with the State.

the circulation, land use and housing elements of the General Plan
"since it provides noise level standards related to the compatibility of
land use, of which residential use will be a highly important component.
. . . The Noise Element is also closely related to the open space element
since noise can adversely affect the enjoyment of quiet pursuits in open
space. Conversely, open space can be employed to buffer noise sources
from sensitive uses through distance and tree planting."

HUMAN RESPONSE TO SOUND--BACKGROUND INFORMATION

DEFINITION OF TERMS

The harm or annoyance produced by noise relates to the intensity, frequency and duration of sound. Intensity, or relative loudness, is measured in decibels (dB). A decibel is equivalent to the smallest increase in sound which the human ear perceives. Measured on a modified logarithmic scale, a doubling of intensity equals approximately six decibels. The ear perceives an increase from 10 to 20 decibels as a two and one-half times increase in sound and from 10 to 30 decibels as five-times increase.

Frequency is the pitch of sound, ranging from the high screech produced by rapid vibrations to the low growl produced by slow vibrations. Pitch is measured in cycles per second or Hertz units (Hz). The perfect human ear hears frequencies from 20 to 20,000 cycles but is more sensitive to the rapid vibrations of high pitch than to the slow vibrations of low pitch. Therefore two sounds of equal loudness (decibels) but of different frequency (Hertz) will be perceived differently. This makes it necessary to weight sound measurements to correlate them with actual human perception.

Duration, the final measurement, is the time pattern of the sound: short-or long-lasting, steady or intermittent, day or night occurrence.

The following glossary of terms is in general usage and is employed by the California Department of Transportation and throughout this report.

- A - Weighting: a network used in sound level meters to filter out extreme high and low frequencies, so as to measure a representative sound level correlating to the response of a human ear.
- Ambient Noise: background noise associated with a given environment, usually a composite of sounds from many sources, near and far. It is the residual noise prevailing after all identifiable noises have been eliminated.
- dBA: a unit, in decibels, for measuring sound level after a sound has been A-weighted.
- Decibel (dB): a measure, representing one-tenth of a bell on a modified logarithmic scale that serves as a basis for measuring the relative loudness of sounds. It is approximately equal to the smallest degree of difference of loudness ordinarily detectable by the human ear.
- L10: the A-weighted noise level which is exceeded 10 percent of the time over the duration of the sample noise measurement. Utilized for the assessment of noise impact of traffic, this method is the standard for the State Department of Transportation.

The following definitions are not used in this report but are often used in noise ordinances and literature on sound. They qualify measurements and may have later application in Mendocino County.

CNEL: "community noise equivalent level" represents a cumulative measure in decibels of community noise during a 24-hour day. It applies weighting factors to account for lower tolerance of people to noise during the evening (7 pm - 10 pm) and night (10 pm - 7 am). It was used in the City of Ukiah Noise Element in relation to airport noise.

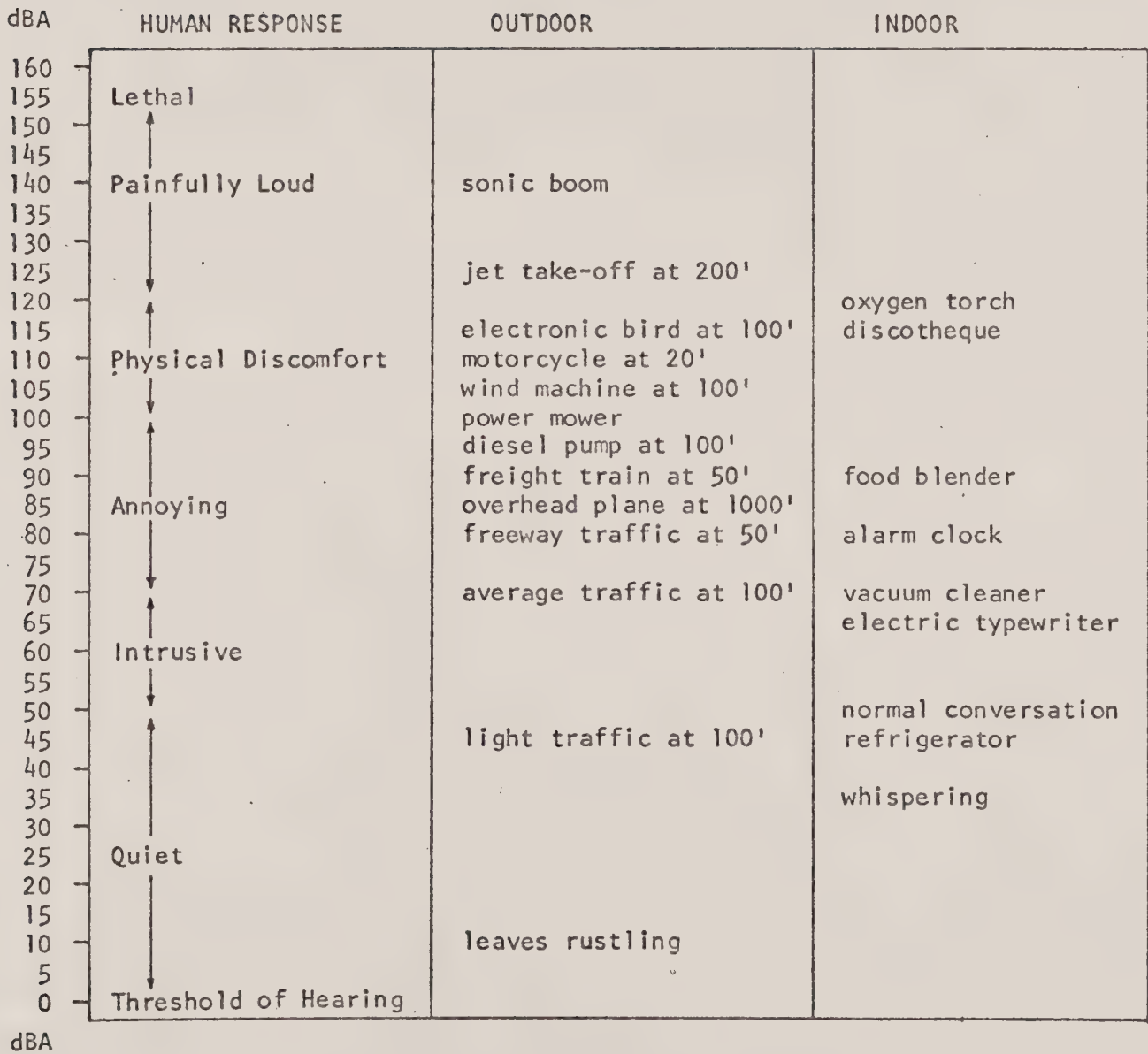
CNR: "composite noise rating" is a scale which accounts for the totality of all aircraft operations at an airport in quantifying the total aircraft noise environment. It is used for evaluating the compatibility of land use around airports.

Ldn: "Day/Night Equivalent Sound Level" is a standard measure used in describing the cumulative effect of exposure to all sources of environmental noise. It is essentially the same as CNEL except that weighting factors are applied only to the nighttime hours (10 pm - 7 am).

RELATION OF NOISE LEVEL TO HUMAN RESPONSE

Units of measurement must be related to experience before we can understand their significance. The decibel scale, the basic sound measurement, runs from zero which is the threshold of sound to 150 which is considered a lethal level of sound. Within this range, many measurements have been taken and several scales compiled. Some variations can be noted in comparing different scales. For instance, normal conversation is rated at 50 decibels on one scale and at 60 on another. These variations generally occur because of different distances between receiver and source during the measurement. The scale on the following page has been compiled from various sources and jointly accepted by the Consultants and the Mendocino County Division of Environmental Health. It explains decibels in terms of recognizable noises and human response. In interpreting it, it should be remembered that 50 decibels is perceived as two and one-half times as loud as 40 and five times as loud as 30.

Acoustical Scale



APPROACHES TO NOISE REDUCTION

Noise can be controlled on three fronts: at the source (the object creating noise), along the transmission path (the route noise follows from source to receiver), and at the receiver (the person perceiving the sound). In theory, full responsibility for noise reduction might rest with the operators of the noise source; in practice, a combination approach on all three fronts is usually called for.

Reduction at the Source

Local government is relatively powerless to control many noise sources and much of the needed regulation has been taken over by the State and Federal governments. Noise emissions of aircraft, rail carrier and interstate motor carrier are subject to federal regulation. Airport operations are under both State* and Federal regulation. Additionally, the federal Noise Control Act of 1972 is a major attempt to eliminate excess noise at the design stage of various new manufactured products. Communities may regulate operation of new or old noise producing equipment however. Cities and counties, for instance, can set speed limits with the aim of reducing noise and limit hours and locations for operation of noisy equipment.

Modification of the Transmission Path

One way to modify the transmission path is to make it longer; the greater

* A very recent court decision (February 1975) may reduce the State's authority.

the distance between noise source and receiver, the less sound perceived. *

New highways should be located as far as possible from noise-sensitive land uses. Sometimes traffic can be rerouted to reduce noise impact.

Requiring deep set-backs or buffer strips within new developments located close to major highways or other major noise sources can help in many cases. Noise travels in almost straight lines and may be stopped or deflected in much the same manner as light. Noise barriers aim at such deflection. In order to reduce noise significantly there must be a solid object blocking the line of sight between the source and the receiver. A short barrier along a roadway will provide very little noise reduction. To be effective, a barrier must extend for considerable distance. Trees and shrubbery are not sufficient barriers unless the planting is very dense and deep. Depressing highways or installing special barrier walls or earth berms at grade are useful noise reduction measures.

Noise Control at the Receiver

Some sites will always be subject to noise. If buildings placed on such sites are designed and sited with the noise source and noise level in mind, the occupants of structures will be afforded some protection. An apartment house can be sited with its narrow blind end towards the noise source, for instance. Acoustical treatment of walls may be needed as well. Regulating land use to preclude sensitive noise uses (residences) in necessarily noisy areas is the best measure and one which is practical in a low density area such as Mendocino County.

* An interesting fact is that noise decreases by a factor of four when distance is doubled.

SOURCES OF NOISE IN MENDOCINO COUNTY

Noise comes from an almost infinite number of sources; for discussion, four major categories have been established: Transportation; Industry and Commerce; Agriculture; and, Other Sources of Noise.

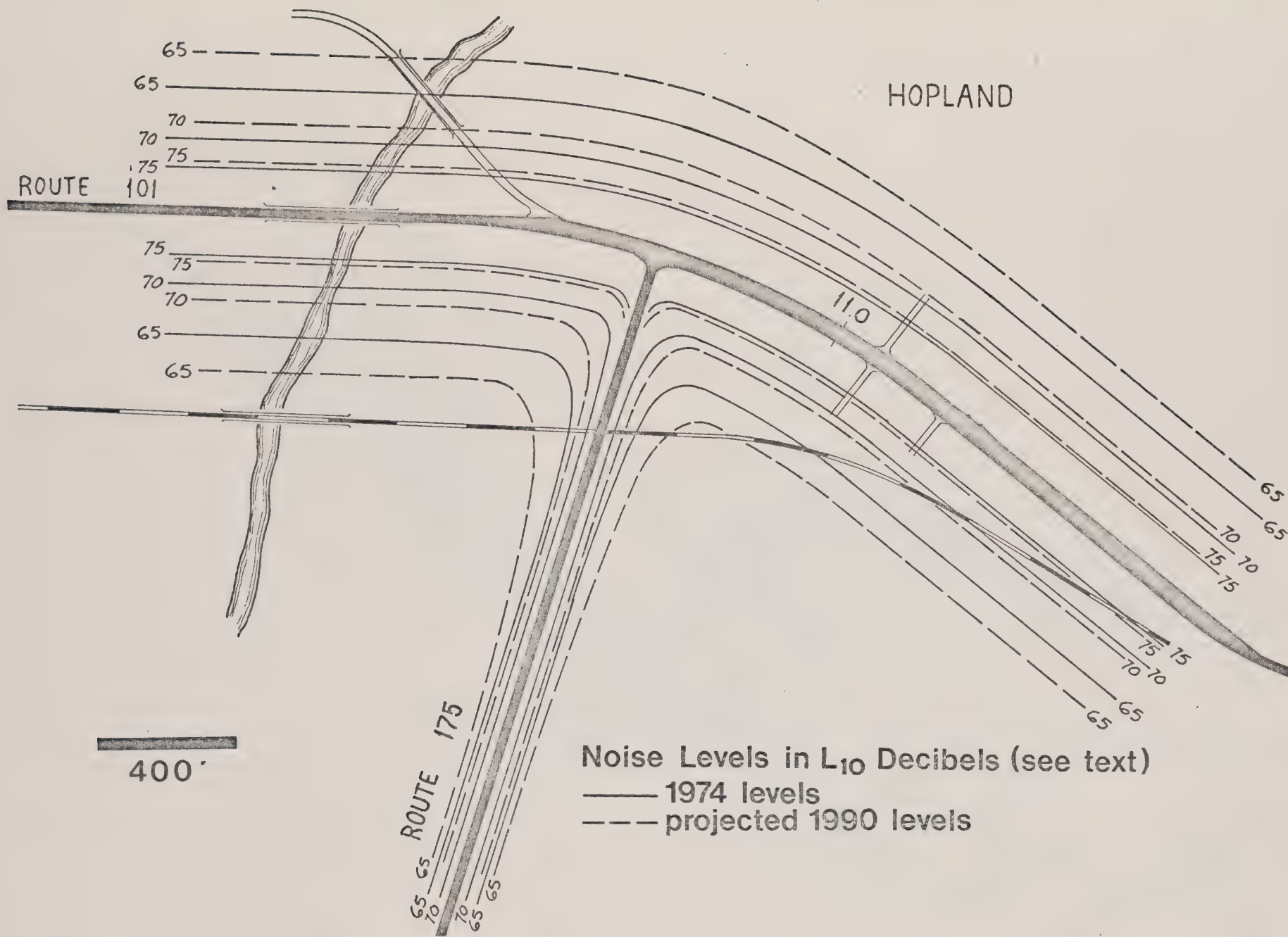
TRANSPORTATION

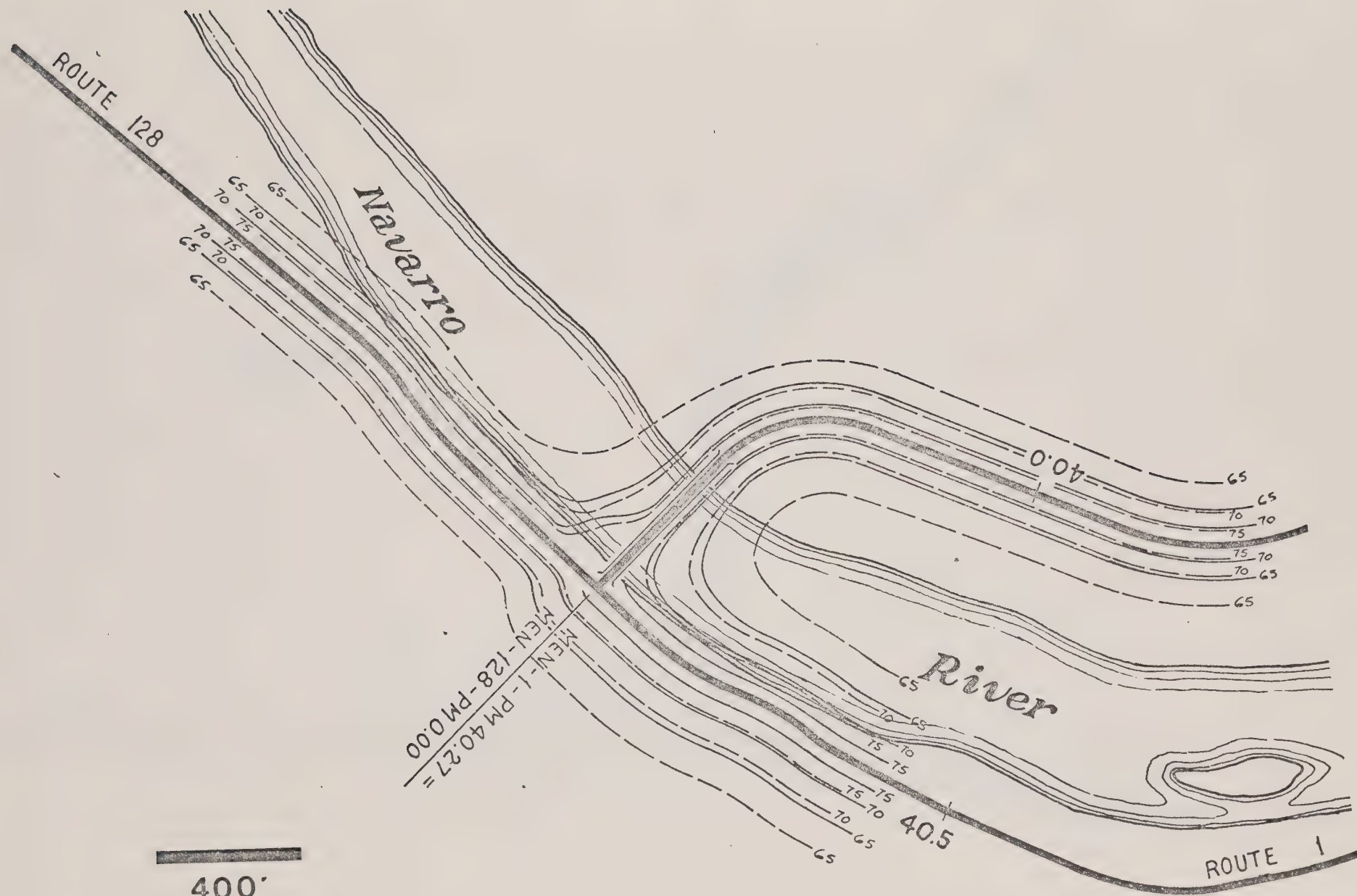
State Highways

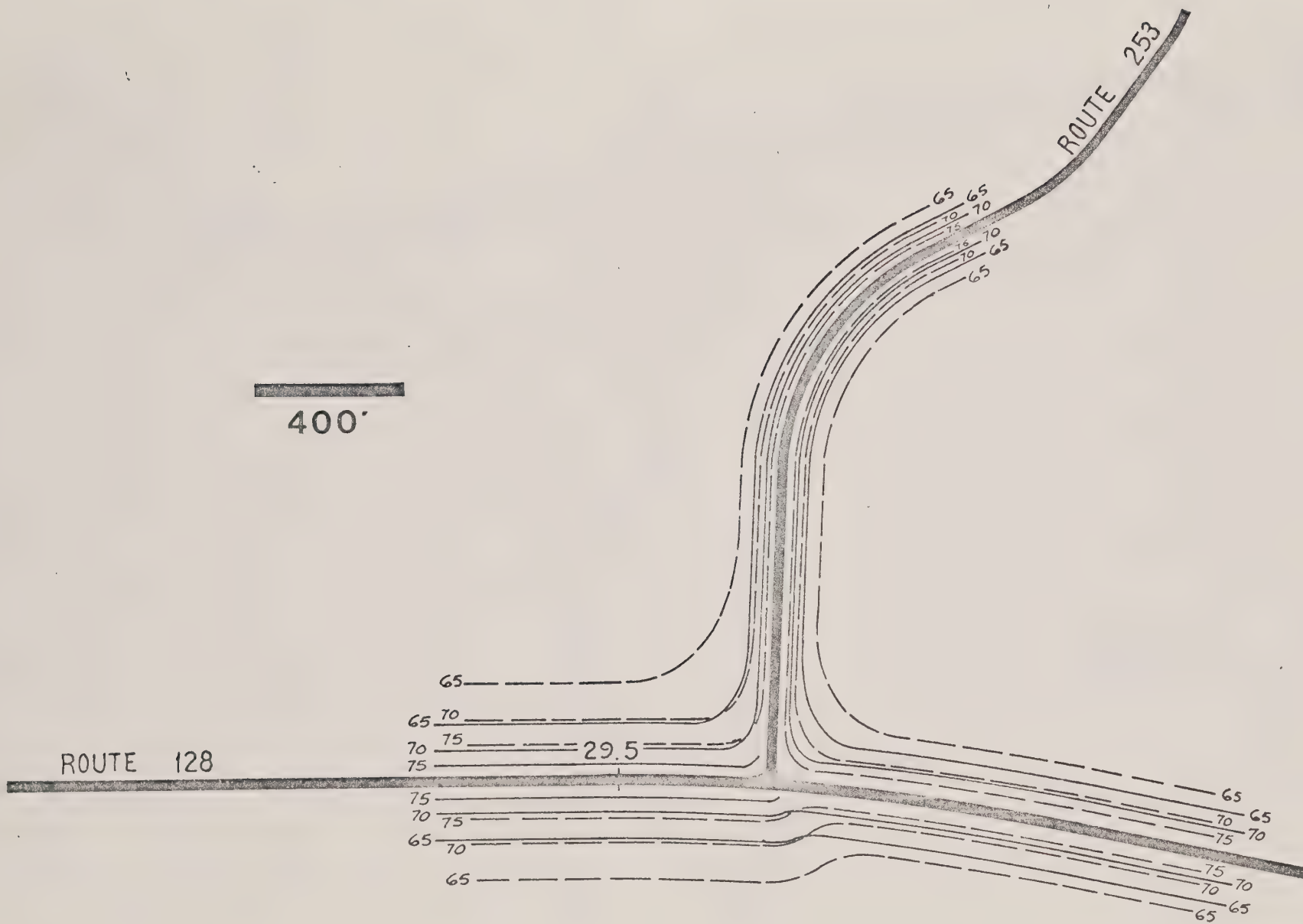
The State Department of Transportation cooperates with agencies preparing noise elements by supplying existing noise measurements and projections for 1995 for all State Highways. In Mendocino County, these consist of strip maps showing contours in urban areas, contours at all State Highway intersections and readings taken along other non-urban stretches.* The large strip maps for the urban areas and their vicinities (Ukiah, Point Arena, Willits and Fort Bragg) are on file in the County Planning office as are the detailed readings. The intersection maps are reproduced here. Additionally, the City of Ukiah has prepared a preliminary Noise Element which contains maps of its area.

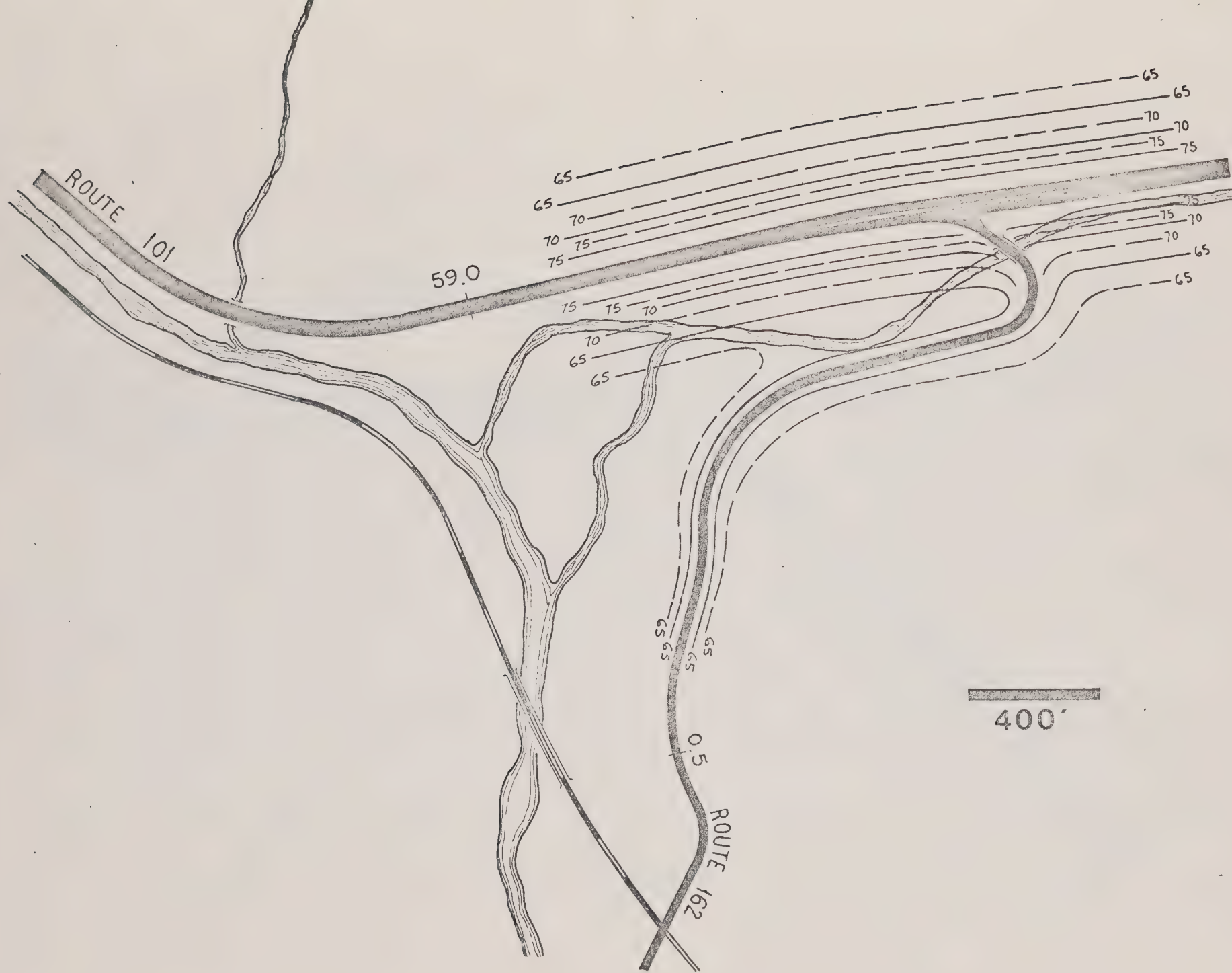
A look at the intersection maps on the pages following are enough to identify Route 101 as the noisiest highway in Mendocino County. At

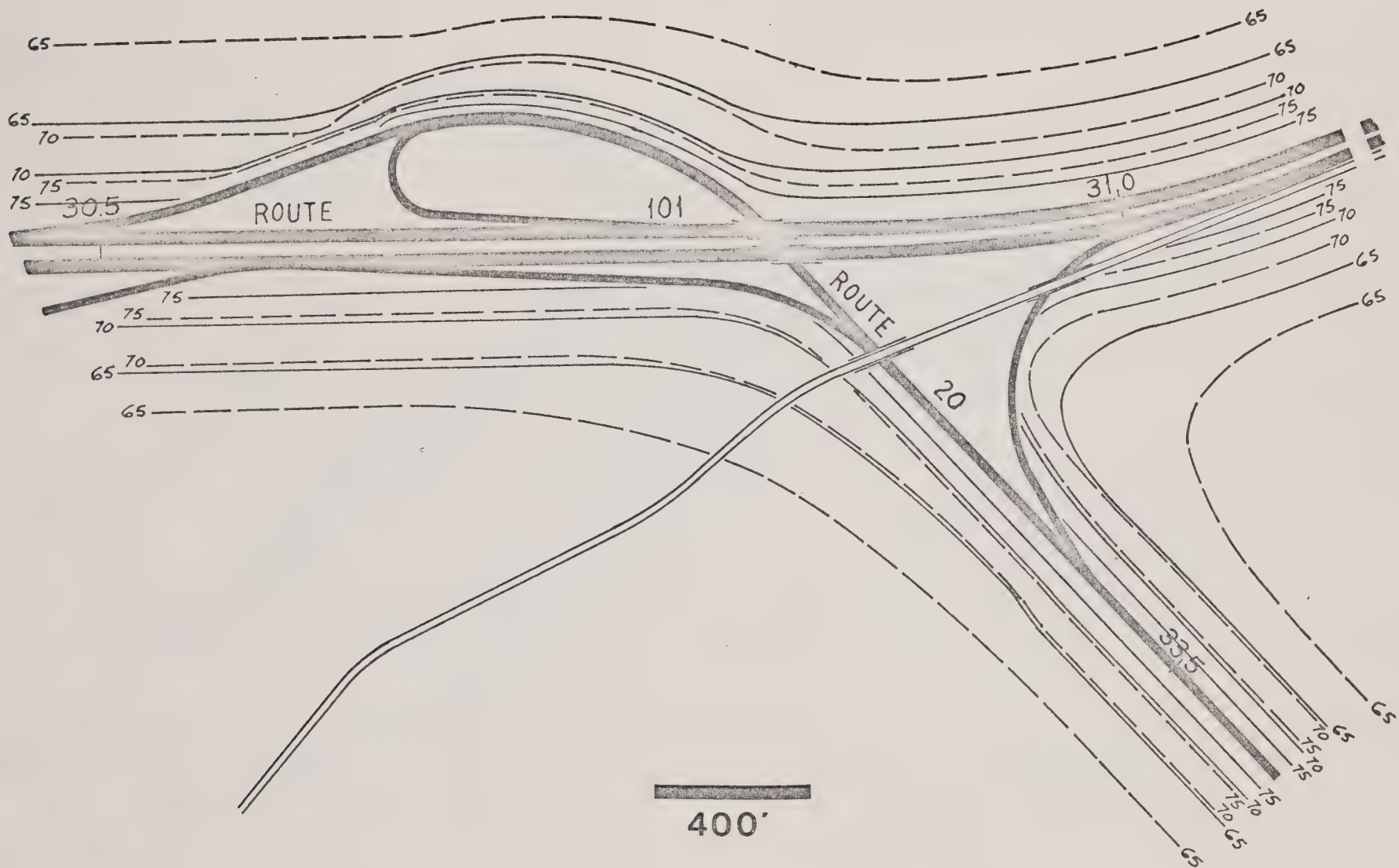
* Readings and contours are based on the L10 definition of noise level.











River

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65

LEGGETT

ROUTE 271

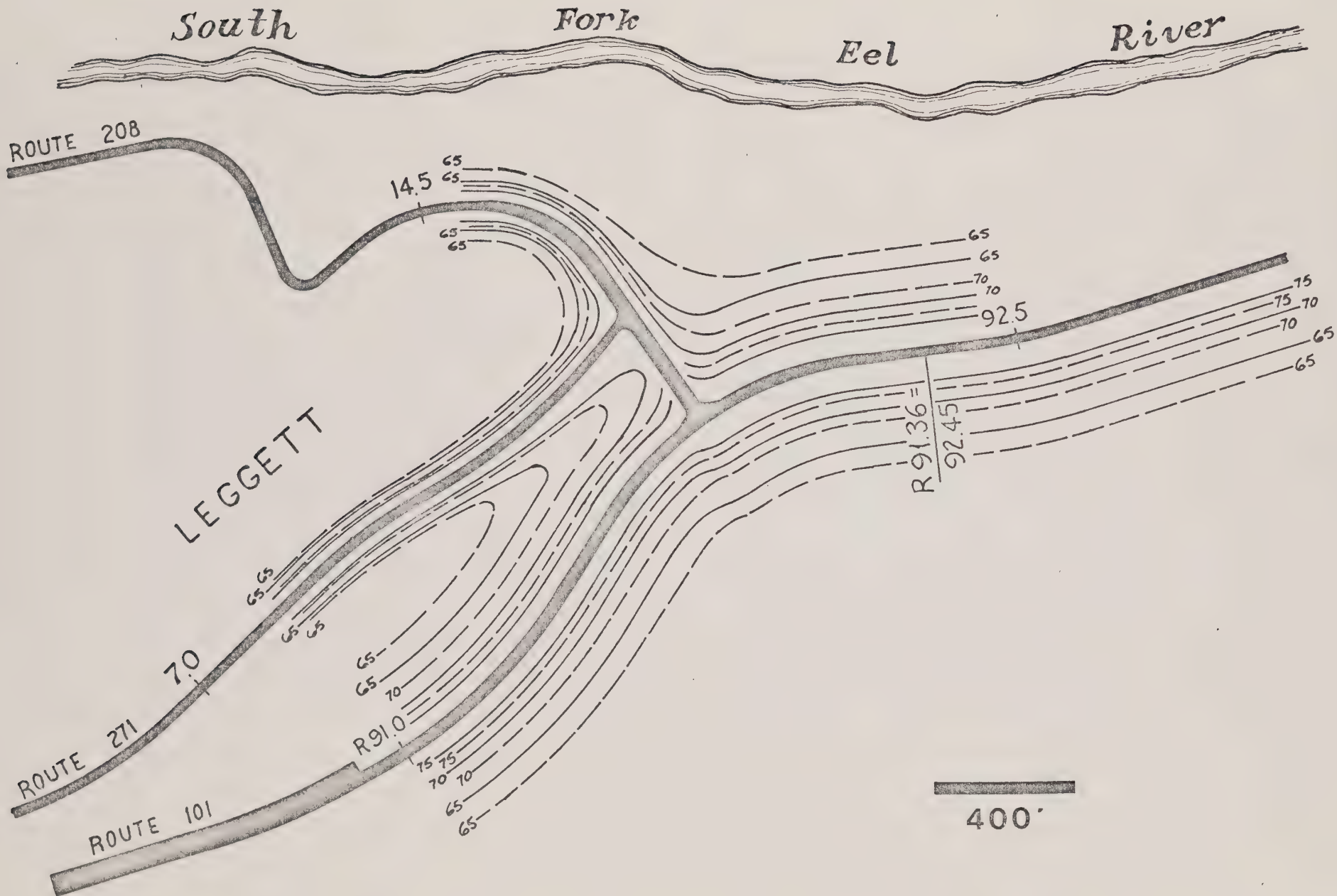
ROUTE 101

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Hopland, for instance, over 65 decibels of sound register for approximately 310 feet from Highway 101; Route 175 shows the same level of sound limited to approximately 60 feet from the road. Through the City of Ukiah, 65 decibels registers at 400 feet from the freeway; the noisiest non-urban reading on Highway 101 was about 9 miles north of the Sonoma County line where 65 decibels registered at 343 feet from the highway; the quietest portion of Highway 101 runs from Reynolds to the Humboldt County line. Even in this stretch, 65 decibels registered at almost 200 feet. Other high readings occur in Highway 1. At the following points 65 decibels register close to or slightly over 200 feet from the highway: at Gualala, at a point 17 to 19 miles north of Gualala and at Fort Bragg. Route 20 is also noisy at Fort Bragg. Other State Highways do not reach these levels. Highway 128 at Boonville, comes closest, registering 65 decibels at 185 feet.

The 1995 projections show all highways with increased noise. Along Highway 101 at Sonoma County line the 65 decibel contour is projected to move outward from the present 335 feet to 453 feet; in the quietest section (close to the Humboldt County line) the 65 decibel contour moves from the present 185 feet to 288 feet. The Department of Transportation's projections are modified extrapolations of past statewide trends; they do not take into account possible technical advances to lower noise emission of vehicles or passage of new noise ordinances. Most significantly, future growth rates of population were not considered. The projections, in general, show what will occur if past trends continue. There is evidence that trends are being modified. Population growth in California

has slowed, technical advances are being made and the future may be more hopeful than the projections indicate. However, noise is and will continue to be a problem along urban and urbanizing stretches of major highways. Now only limited areas are seriously affected but the problem can become more serious as urbanization spreads. Future land use planning must take the potential noise problem into account to keep the annoyance at acceptable levels.

Railroads

The Northwestern Pacific Railroad runs north through Cloverdale, Ukiah, and Willits. At Longvale it turns eastward to the Eel River Valley which follows it to Eureka. The line carries only freight at the present time. (Amtrak passenger service follows a more inland route through Sacramento and Dunsmuir and does not pass through Mendocino County.) The California Western Railroad running from Willits along the Noyo River to Fort Bragg has become famous as a recreational passenger line with its Skunk Train which is very popular with train buffs and others during the summer months.

The Division of Environmental Health in Mendocino County reports that the railroads typically produce 65 decibels at 400 feet from the tracks. They are, therefore, noisier than the highways for the brief times of train passage. Neither line is heavily used at present and, since most of the routes traverse unsettled rural areas, the only areas affected by noise are within the cities. No reports have been received that indicate a severe problem or one which warrants action.

The Northwestern Pacific line is considered an important link in the transportation system of Mendocino County and there would undoubtedly be local opposition to abandonment. The heavy freight it carries, though limited in amount, results in fewer trucks on Highway 101 and in this respect, it contributes to lower noise levels at crucial points in the County.

Future problems can be avoided by permitting only appropriate uses within the high noise area bordering the tracks. Industrial uses which are tolerant of noise and which use the railroad for shipping are, of course, the most appropriate; residential uses are totally inappropriate.

Airports

The County of Mendocino maintains an airport on the coast at Little River, Fort Bragg and Ukiah have municipal airports and Boonville has a small private air strip. In addition, the aerial tankers which fight fires fly from an airport west of Willits. There are no scheduled airlines serving the County now.

The Division of Environmental Health, Mendocino Health Department, took measurements at the Ukiah Airport and found that the small planes using it produced 70 dbA at 600 feet from the runway. This is typical of all air operations in the County, except those of the aerial tankers. These are considerably noisier and when the flights originated at Ukiah,

aerial tanker noise was a problem for the urban residents. Now the flights avoid all urban areas including Willits which is closest to the airport.

The small air strip at Boonville has residences in the flight pattern and more are planned immediately adjacent. This was a conscious decision of the community, the airport operators and the subdividers who hope to attract second home or permanent residents with private planes. It appears these are people who value proximity to an airstrip sufficiently to tolerate the noise. The location and orientation of the airstrip at Fort Bragg is such that most flights land and take off without passing over the City. In Ukiah, the orientation is not so advantageous; flights pass over the main portion of the urban area. Some noise intrudes into residential areas in both cities but the problem is greater in Ukiah. Scheduled flights into Ukiah would intensify the problem to the point where severe annoyance would occur. No problem is present at Little River.

The Ukiah General Plan recognizes "the proximity of the airport to urban uses and the lack of adequate clear zones" as problems. It has a goal "to continue the current level of service at the existing airport" and does not recommend an increase in facilities and services. The City is currently expanding its clear zones to meet FAA requirements. The report also recommends "that stringent zoning controls be enforced to retain expanses of land surrounding the airport in open space or non-residential use." The noise element of the Ukiah General Plan maps the Community Noise Equivalent Level for the airport and incorporates the recommendations above.

COMMERCE & INDUSTRY

Business and manufacturing are relatively noisy activities; they involve concentrations of people, traffic, and machinery, all potential sources of noise.

Commercial Noise

This is primarily a city problem in Mendocino County since the major concentrations of stores and businesses are within the incorporated areas. The small unincorporated towns such as Point Arena, Laytonville and Covelo have small centers which have a mixture of commercial and residential uses. The nature and scale of these centers is such that the uses are compatible and noise complaints do not arise. No monitoring of noise has been done in such areas and no problems have been identified.

Industrial Noise

The lumber mills are the major source of noise which can be classed as a problem within the unincorporated towns and county area. Its effects are most evident in small settlements such as Laytonville where significant numbers of people live close to the mills. A modern mill, on the average, produces noise levels of 65 dbA at a distance of 400 feet; beyond that, the level diminishes but, due to the low ambient noise level in the small rural communities, the noise may be very evident even though it is within the range of what is normally considered acceptable.

Most of the mills have made progress in reducing noise by enclosing planers and other extremely noisy machinery; a few, such as the one in Laytonville, have not been able to accomplish as much.

Discussion of mill noise must take into account the importance of the lumber industry to the economy of the County and the current slowdown in lumbering operations which resulted from the nationwide slowdown in construction. Very few residents will be found who would ask a mill to expend major funds for noise reduction at this time or who are unwilling to tolerate a fairly high level of noise in the vicinity of a mill. Wherever feasible, however, mill noise should be reduced. More important, additional urbanization should not occur within the area of high noise level surrounding mills.

Gravel crushing operations, producing an average of 70 dbA at 400 feet from the operation, are slightly noisier than the mills. However, such operations are not close to residential concentrations and create no problem at this time. Care should be exercised that problems do not arise in the future. Good land use planning can ensure this.

AGRICULTURE

Agriculture is generally considered a peaceful and quiet pursuit which bothers no one, and, in turn, is not bothered by any other activity. It

is normally rated as compatible with all other land uses. Broadly speaking this is true. However, modern intensive agriculture makes use of machines and equipment which produce noise and this noise may be more apparent than urban noise. The intermittent emission of agricultural noise and the low level of the ambient noise are the reasons why noise in the country is more noticeable and potentially annoying to non-farm residents. Major noise making machines and equipment used in Mendocino County are the electronic birds placed in vineyards (producing 110 dBA at 100 feet), diesel pumps and wind machines. The wind machines, used to keep killing frost from forming, are gradually being phased out as water spray methods are substituted. In the future, one diesel pump will replace several wind machines in each field resulting in reduced noise levels. This is particularly significant since much of the operation is at night.

The operation of mechanical devices and machinery is necessary to modern agriculture and is essential in any agricultural area today. The importance of food production to the economy and well-being of society need not be stressed here. Buyers should be forewarned of potential noise and understand that public action to abate such noise will not be taken unless the use of faulty equipment over long periods of time can be proved. The burden of compatibility would rest heavily with the non-farm uses. In urban or suburban situations this would not be the case; in a residential neighborhood an individual would not have the right to set up an electronic bird in his garden for instance.

Additionally, it is hoped that federal control at the design and manufacturing stages will gradually reduce noise emissions of power tools such as chain saws and mowers.

OTHER SOURCES OF NOISE

No systematic research has been done on other noise sources in Mendocino County, since problems have not been widespread or severe enough to create public pressure for detailed surveys or research. In conversation with citizens and officials, the Consultants found there were complaints or growing concern about barking dogs, motorcycles and bikes, sirens on emergency vehicles and mill whistles which blew to announce coffee breaks and lunch periods. A few complaints were heard on industrial noise. These were focused on plants located within incorporated cities rather than those located out in the country.

The federal Environmental Protection Agency recently published a list of noise annoyances in Boulder Colorado. This list, compiled through surveys of citizens, show motorcycles as the most extensive and intensive annoyance with barking dogs and emergency sirens rated 4th and 6th respectively. With the exception of neighborhood noise and construction, the other annoyances in Boulder had to do with transportation modes already discussed in this report. Although mill whistles were not mentioned in Boulder, the sources of noise annoyance in Mendocino County and Boulder appear similar. This is probably true in most parts of the

country though the scale of the problem will vary immensely from place to place. The complete list from Boulder is given below as general information.

Noise Sources in Descending Order of Annoyance - Boulder, Colorado, 1972

1. motorcycles
2. cars
3. trucks
4. barking dogs
5. buses
6. emergency vehicle sirens
7. neighborhood noise
8. construction
9. aircraft
10. railroads

INITIAL NOISE ELEMENT

POLICY

In the various policy conferences held in Mendocino County many people expressed appreciation for the peace, quietness and tranquility which are so basic to the high quality of life here. References to noise as a problem usually applied to specific and limited annoyances or to the unfortunate but necessary noise associated with the lumber mills or agriculture. Most people were aware of measures taken by the mills to reduce noise. There was also a desire to keep high speed noisy highways out of such quiet places as Anderson Valley. No specific policies were spelled out but the discussions imply that, as a policy, the County desires to protect its environment from noise, the unwanted sound which could intrude as population increases; further, it wants to eliminate existing noise problems whenever feasible.

The guidelines for preparation of the Noise Element wisely require a policy statement as a major component. In addition to the general statement above the following policies have been derived from discussion with officials and citizens:

- . Noise shall be one of the factors to be considered in all future land use and development decisions.
- Unnecessary existing noise shall be eliminated.

- . Existing land uses shall be protected from the intrusion of new noise; protection will take various forms and may include zoning controls, requiring buffer strips around new uses or other appropriate treatment.
- . Lumbering and agriculture are basic to the economy of Mendocino County and necessary noise associated with them must be tolerated; however, residential buyers should be informed of the noise potential of sites affected by these industries.
- . The Division of Environmental Health of the County Health Department should undertake a program of education and, where feasible, give technical advice to assist operators of noisy equipment to reduce noise emissions.
- . The County shall make efforts to buy automobiles and other equipment which have the lowest sound emissions and to maintain all equipment so as to reduce sound emissions as far as feasible. In general, the County shall use good practices and keep abreast of all new advances in the field.
- . The County shall work with the State Department of Transportation to mitigate the affects of existing highway noise and to avoid future noise problems through careful analysis at the design stage of all new highway improvements.
- . County efforts for noise suppression and reduction shall be coordinated with those of the cities; this can best be done through the County Health Department, through the Division of Environmental Health since it has jurisdiction in all areas of Mendocino County.
- . Within the near future, the County should consider a noise control ordinance consistent with the stated policies and within its capacity to enforce equitably.

SUMMARY OF MAJOR NOISE SOURCES IN MENDOCINO COUNTY

Highway noise is the most pervasive and airport noise the loudest.

Railroads also generate significantly high levels. The following table summarizes the findings of the County Division of Environmental Health and the State Department of Transportation.

Major Noise Sources

<u>Use</u>	<u>Decibels</u>	<u>Feet from Source</u>
Lumber mill	65	400
Diesel pump	95	100
Diesel pump	65	400
Electronic bird	110	100
Electronic bird	65	400
Gravel crushing	70	400
Railroad (typical)	65	400
Ukiah airport	70	600
Highway 101 at:		
south boundary of County	65	340
through Ukiah	65	400
Highway 1 at:		
Gualala	65	200
Fort Bragg	65	200

NOISE STANDARDS

The standards given below are suggested by the United States Environmental Protection Agency. The rationale for the standards is the private residential uses are more sensitive than public commercial and industrial uses and therefore more stringent noise standards are justified to protect homes.

<u>Acceptable Noise Levels</u>		
	<u>Ambient dbA</u>	<u>Single Event dbA</u>
Residential Neighborhood		
exterior	55	+6 = 61
interior	45	
Commercial & Industrial		
exterior	65	+8 = 73
Construction Project		86

More detailed standards covering all activity areas and land uses within the community are needed. The chart on the following page sets up acceptable ranges of noise acceptability for all land uses. It was developed after studying the standards of various cities and in consultation with the Mendocino County Health Department. The three ranges of acceptability are defined as follows:

Acceptable:

the noise exposure is such that the activities associated with the land use may be carried out with little or no interference from noise and both indoor and outdoor environments are pleasant for residential use.

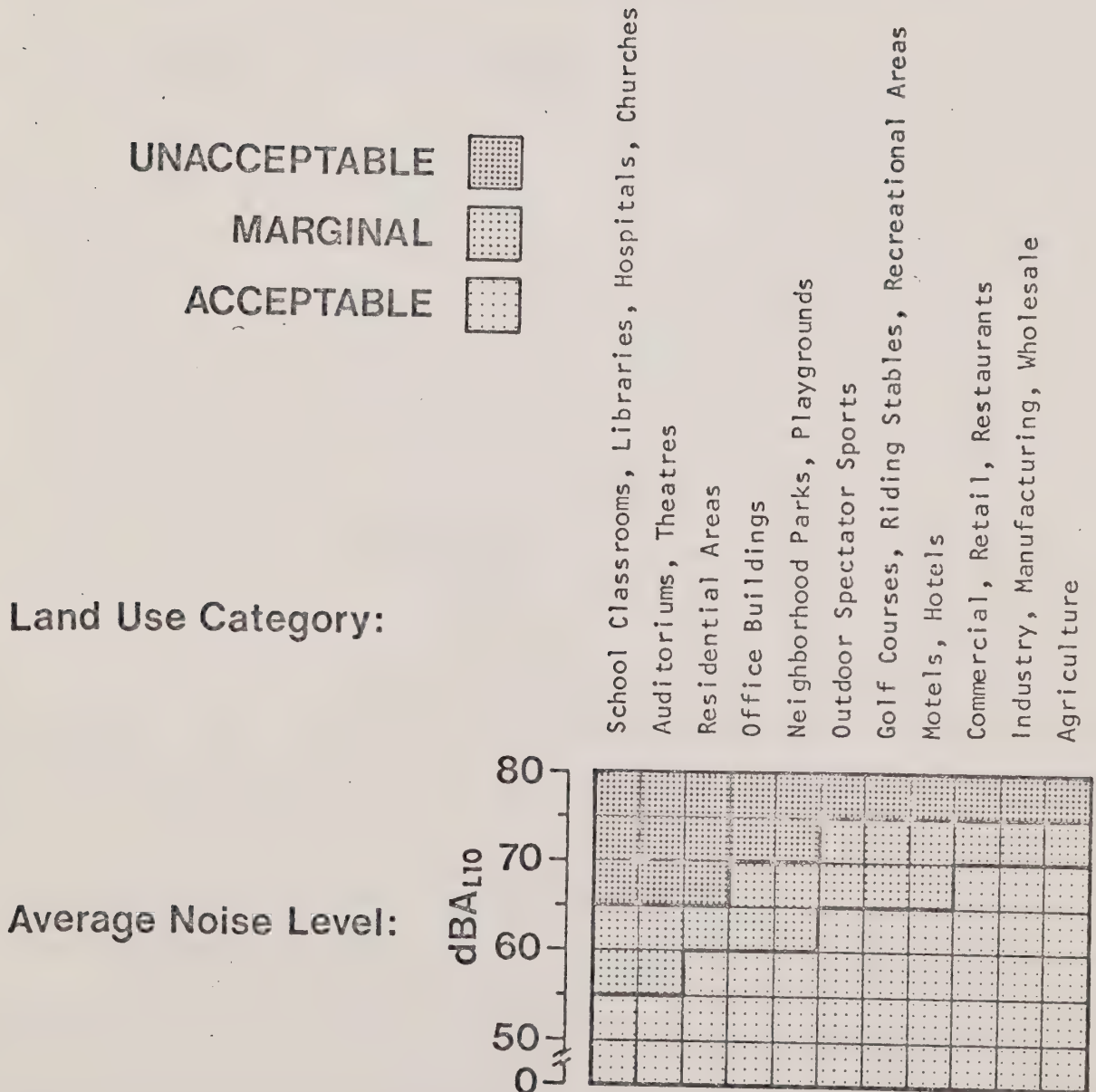
Normally Unacceptable: the noise level is sufficiently high that outdoor activities can be made tolerable only by the construction of properly designed sound barriers, and indoor activity will require unusual and expensive acoustical treatment of buildings.

Clearly Unacceptable: the noise exposure is so severe that construction costs to make the indoor environment acceptable would be prohibitive, and that the outdoor environment would be intolerable for normal use even with acoustical barriers.

The Division of Environmental Health in the County Health Department has also established some preferred levels or goals for the more sensitive uses and differentiated between day and night levels.

	<u>Preferred Level of Sound (dbA)</u>
Residential	40 at night
	50 during day
Commercial	55 at night
	60 during day

Acceptable Noise Levels for Various Land Uses



The goal is lower than that deemed acceptable on the preceding table. It points up the fact that "acceptable" is not perfect and that if there is wide community agreement and determination, there is justification for aspiring to higher standards than those on the table. This fact and the need to distinguish between day and night levels will need to be considered if the County decides to pass legislation concerning noise.

GUIDE TO IMPLEMENTATION OF THE NOISE ELEMENT

Noise as a Criterion in Land Use Planning

The background information sections of this report show that Mendocino County still has the opportunity to avoid major noise problems by taking noise into account in its planning for future land uses. Past land use planning and implementation did not entirely ignore noise as a consideration. For instance, extremely noisy activities, along with those which are odoriferous or dangerous are excluded from most zoning districts. Proposed zoning changes would provide additional limitations on such uses by eliminating the wide-open A-1 district and setting performance standards for all uses. However, the pervasiveness of the noise problem has not been recognized and it has not been treated comprehensively.

This must be done to halt the trend towards an unacceptably noisy future. The chart of the following page utilizes the proposed noise standards to form a matrix of compatibility for land uses based on noise generation




and toleration levels for all activities.

In the small unincorporated towns and rural portions of the County some of the relationship recommendations implicit in the matrix will have little immediate application; yet even with the slow growth and very gradual urbanization projected for Mendocino County, potential conflicts will arise with increasing frequency and the matrix will prove a useful guide to land use and development decisions. An example of how the matrix may be applied in the near future is in judging a proposal for a new mobile home park adjacent to a major highway. This location might appear reasonable since highways generally traverse relatively level and developable land and mobile homes could be moved to the site expeditiously. However, mobile homes are a residential use, incompatible with highway use. Moreover, mobile homes are generally less sound proof and therefore less tolerant of noise than are conventional homes. A noisy mobile home park would be less desirable than a quiet one; if competition arises, it may deteriorate to the detriment of the community at large as well as the owner. The matrix shows the incompatibility due to noise and this should be a major factor in the final decision. Only if it is proved feasible to provide effective sound barriers should the location be approved for a mobile home park.

Specific Measures to Limit Noise Impact on New Construction

The County can promote site planning, building orientation and design, and interior layout to lessen noise intrusion. Building setbacks, which

Noise Compatibility of Adjacent Land Uses

COMPATIBLE 
MARGINAL 
INCOMPATIBLE 

	hospitals, nursing homes	schools, libraries, churches	residential*	parks, cemeteries	transient lodging, playgrounds	commercial, business	agricultural*	traffic thoroughfares	industrial, manufacturing	highway rights-of-way	airports
hospitals, nursing homes	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
schools, libraries, churches	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
*residential	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
parks, cemeteries	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
transient lodging, playgrounds	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
commercial, business	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
*agricultural	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
traffic thoroughfares	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
industrial, manufacturing	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
highway rights-of-way	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE
airports	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE	COMPATIBLE

* Exception: In agricultural areas where wind machines, electronic birds, etc. are in use, non-farm residential development and agriculture are not considered entirely compatible - see text for discussion.

increase the distance between source and receiver of noise, can be important. Siting buildings with narrower dimensions facing noise source reduces intrusion of sound; sometimes buildings can be sited to shield (or be shielded by) other buildings. Sometimes interior layout can be arranged to locate bedrooms in the quietest portion of a building. In its role of reviewing project plans and informally offering professional advice on site development the Department of Planning and the inspection agencies can suggest ways to help protect occupants of new buildings from outside noise.

State imposed noise insulation standards apply to all new residential structures except detached single family dwellings. These standards should be rigorously enforced to insure that residents are not disturbed by noise from adjoining units or exterior noise. The state standards do not apply to non-residential uses but protection is often important in commercial or industrial buildings as well. The County can promote the incorporation of noise insulation materials in all new structures.

Reduction of Highway Noise

Highway design and routing can determine noise levels in many locations. Noise cannot be the only factor considered but it should be given weight along with other concerns in all new highway and county road design and routing as well as on proposed improvements of existing rights-of-way. Emphasis can also be placed on maintaining streets and county roads in good condition since poor pavement contributes unnecessary noise.

The County owns and operates many automobiles and other vehicles. As a policy, it should purchase models with the lowest noise emissions and adequately maintain all vehicles to reduce noise. State law requires that emergency vehicle sirens produce at least 90 decibels of sound at a distance of 100 feet. Discretion by the County is limited to policies of restricting use of sirens to genuine emergencies and to the type of siren used. The new warbling type has proved most annoying. Policies regarding use and type of siren may need to be revised.

According to the California Motor Vehicle Code the County has the authority to restrict traffic and to set speed limits on County roads. At this time, no recommendations for changes are contemplated but it should be recognized that reducing speed results in reducing noise as well. In the future, some modifications to existing speed limits in certain sensitive areas may be advisable and wherever noise becomes a problem, this should be considered. The Motor Vehicle Code also contains noise emission standards which are enforceable by the County on its roads (on State highways enforcement is by the State Highway Patrol). A method of enforcement, which would emphasize education and compliance should be developed for the County.

The State Department of Transportation has a program for noise reduction on existing freeways in highly sensitive areas. Funds are limited and a system of priorities is being set up. Mendocino County should identify

its most serious problem area or areas and submit an application for the priority list for 1975-76, if it has a problem area which is eligible for assistance.

Airport and Railroad Noise

Some adjustment to flight pattern at Ukiah Airport may be possible to eliminate unnecessary noise but feasible changes are very limited. The most effective way of reducing noise problems connected with either rail or air transportation is to regulate land development in the noisy areas as Ukiah has recommended. Only highly tolerant uses should be permitted in the areas affected. Any new airport which may be located in Mendocino County, would, of course, have to consider existing development in picking a location and in planning its operations. If scheduled flights are proposed at some future date, a new airport will have to be considered.

Industrial Noise

The need to tolerate a certain amount of noise from lumber mills has been discussed in the background material. In this case, the County measures may be limited to advice and technical assistance to eliminate noise where it is economically and physically feasible and to take steps to abate obvious abuses of the industry's special position and privileges in the County. One suggestion is that the loud whistle (loud enough to be heard over the operating machinery) used to signify lunch hours and coffee breaks in the mills could be eliminated by substitution of a light signal. The safety aspects of this should be investigated.

Agricultural Noise

Agricultural noises must be recognized as necessary in rural areas. Land use planning to limit the conflicts between agriculture and urbanization is most important. Some technical assistance on means to eliminate unnecessary noise should be made available either through the state farm agencies or the County offices.

RECOMMENDED FUTURE ACTIONS

In addition to adopting policies and approaches suggested in the Initial Noise Element, Mendocino County should consider the adoption of a comprehensive noise control program and ordinance. The United States Environmental Protection Agency estimates that at least a year should be spent in studying and drafting an ordinance since it is necessary that officials and citizens gain understanding of how the ordinance is to be administered and enforced. It is also necessary for them to gain a feeling of specific noise levels as measured by the noise measuring equipment and to learn how much a program will cost.

EPA⁴ advises that it is extremely important that only one agency be given primary responsibility for enforcing and executing the Noise Control Program.

It recommends the program allow and encourage voluntary compliance with penalties and fines reserved as a last resort to achieve the goal of a quieter environment. Such a program would probably prove to be an unwise burden for the County Sheriff's office where the prevention of crime is the primary responsibility. It might better be the responsibility of the County Health Department through its Division of Environmental Health.

The County Health Department has jurisdiction over the cities as well as the unincorporated County. When the Initial Noise Element has been

adopted by the County, each City should be encouraged to join with the County by adopting parallel elements. The cities should be involved in the recommended comprehensive noise control program and ordinance development as well. The City of Ukiah has made an initial start by adopting a short noise element as part of its recent General Plan Revision and has expressed interest in a joint element and program. This should be followed up by the County.

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